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SEVERAL ARTICLES

OF

Eſſential Importance and Benefit,

TO THE

Maritime Part of Mankind,

Which have been generally and ſucceſsfully
adopted and proved:

AS FIRST DEVISED AND RECOMMENDED

BY THE AUTHOR OF

TUTAMEN NAUTICUM;

OR THE

SEAMAN's PRESERVATION.

PRINTED IN 1758.

BRITISH MUSEUM

SEVERAL

Articles of Eſſential Importance, &c.

From *Tutamen Nauticum.*

THE arguments in ſupport of the methods of ſafety, recommended in the above work, are now ſo firmly eſtabliſhed on the ſolid baſis of experience and fact, that they probably may no more meet with reſiſtance, either from malevolent, ignorant, or invidious oppoſition. To argue in favour of theſe now ſelf-evident propoſitions, would therefore not only be unneceſſary, but puerile and nugatory. To the full conviction of ſatisfactory experiment and fact, the appeal now lies. Let truth prevail. See what has been done. Health has been wonderfully preſerved on board our navy, and many ſhip-wrecked mariners have been ſaved from ſudden death.

Propoſitions of eſſential public benefit, carried into ſucceſsful execution, and adopted with general approbation, ſanctioned a confidence in the author of Tutamen Nauticum, that his endeavours would not, by a virtuous people, be totally neglected or unnoticed. But he has ſeen other men boldly aſſume the recompence of his labours, and grow rich with contracts, for ſupplying the articles of ſalu-

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Who firſt ſuggeſted theſe uſeful means to the Lords of the Admiralty, by his then patron Lord Egmont, when he preſided at that board, may poſſibly be recorded in their minutes; if not, they *are* in the Tutamen Nauticum, ed. 1754. Under the ſame auſpicious patronage he then recommended to the attention of that honourable board his method of preſerving the lives of ſeamen, &c. in caſe of ſhipwreck, or any other dangerous diſaſters in which men are liable to be drowned at ſea; which he propoſed to effectuate by means of a very ſimple but moſt aſſured and experimentally proved means: namely, by cork-jackets, which they did not refuſe to adopt, being perſuaded, what he ſo recommended was an indubitable ſecurity, againſt which no argument could be ſupported. And accordingly, their Lordſhips gave orders that a certain number of theſe jackets ſhould be provided and put on board ſome of his Majeſty's ſhips, particularly Commodore Byron's ſhip, the Dolphin, deſtined on a voyage round the world in the years 1764, 1765; who being frequently obliged to ſend his men to land, in great ſurfs, among rocks, and in other perils, for the benefit of getting freſh water, on many of the unknown

known Iſlands they viſited; always ordered theſe jackets to be uſed; by which means the people, thus neceſſarily hazarded, were always ſaved from deſtruction, in the moſt dangerous enterprizes of that ſort.

And indeed the want of freſh water at ſea is itſelf ſo dreadful a calamity, that the ſame board of Admiralty have very wiſely and humanely conſidered it; and have, it is ſaid, offered rewards to ſuch ingenious and ſcientific men as could contrive any means of obtaining freſh water at ſea, either by edulcoration, diſtillation, or any other means; and have actually, as report goes, paid large rewards to ſome perſons who have pretended to make advances towards ſuch a deſideratum. But ſince the publication of *Tutamen Nauticum*, there does not appear any better method of obtaining potable water at ſea, than that propoſed in the ſaid book, and threrein recommended. See *Tut. Naut.* edit. 4. p. 90, 91. A. D. 1764. But the author never received, or indeed ſolicited, any reward: “Sic tulit Alter Honorem.”—“Sic Vos, non Vobis, &c.” And indeed, upon this occaſion, and this dread calamity, in which thoſe who periſh, generally die manaical, or idiotic; ſee *Tut. Naut.* p. 59. This author extending and exerciſing his thoughts to the utmoſt of his abilities, at length ſuggeſted another very unthought-of, and as has been generally acknowledged a * moſt curious, intereſting and *certain* means of preventing the evils which happen in conſequence of want of water in extreme at ſea. Perhaps no diſcovery produced in the preſent age is of more eſſential, vital importance to ſea-faring people, than the ſimple but certain, well-aſcertained expedient he deviſed and recommended in ſuch extremities.

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* See Dr. Blane and other Medical writers.

He had made animal abſorption, the ſubject of his moſt ſtudious contemplation and inquiries for a number of years. In the courſe of which he found that immerſing the human body in tepid water; the water was always diminiſhed in quantity, ſometimes more, ſometimes leſs: he found a crowd of phyſicians and phyſiologiſts, who had noticed and recited many inſtances and examples of their own ocular proof of this truth: he [illegible] made further trials, which all concurred to corroborate and confirm this opinion: he then began to extend his reflections, and to conſider if the body were to be immerſed in like manner in the ſea-water, whether the abſorption would be obſervable; and he found that the diminution was nearly equal to what the tepid ſweet water had ſuffered by the abſorption of the immerſed body. He then examined if thirſt was not increaſed by the imbibition of ſaline particles, entering the abſorbent pores along with the ſea water; but found that thirſt was diminiſhed, not increaſed; and that urine was made more abundantly, and that, not more than commonly charged with the ſaline mixtures. He alſo examined and found the remainder of the ſalt-water in the bathing tub, was heavier and more ſaline after the bathing; which cauſed him to conſider the comparative magnitudes of diameter, between a particle of ſea ſalt, as floating in ſea-water, and the diameter of one of the abſorbent apertures or orifices, which he finds ſmaller than the diameter of the particle of ſalt; and of conſequence the ſalt cannot and doth not enter the pores of the body, during its immerſion in ſalt-water. He then enquired how this immerſion affected people in great and burning thirſt? As was fully tried by Captain Kennedy of Liverpool, when ten or twelve of his men were *periſhing* for want of water. They were ſhipwrecked on an unknown land in America, and were ſaved; their thirſt being removed and ſubdued entirely, by dipping their cloaths in the ſea-water, and then putting them on; and by repeating this proceſs, they eſcaped inconvenience in any dangerous degree, and ſaved their lives by this means only. But had theſe miſerable men an opportunity of immerſion in tepid ſea-water, they would certainly have received a more copious benefit, have had little or no cauſe to lament the abſence of potable water; and would likewiſe have avoided the ſmarting inconveniency of being fretted and galled by the cruſts of ſalt retained in their cloaths, by which they ſuffered ſome diſtreſs. See Captain Kennedy's Narrative, Annual Regiſter, 1769. †

Dr. Blane, in his ingenious eſſay on preſerving the health of ſeamen, p. 49, ſays, "Here I cannot help mentioning alſo, that in caſe of great extremity, it has been found that the blood may be diluted and thirſt removed by wetting the ſurface of the body, even with ſea-water, the vapour of which is always freſh, and is inhaled by veſſels on the ſkin, whoſe natural function it is to imbibe the moiſture that floats in the atmoſphere."

Tutamen Nauticum, p. 76, ed. 4th, § 2. You are told that foul air on board of ſhips is extremely common and detrimental; that it originates chiefly in the *bilge*, from the putrid water confined in that cavity. He therefore *adviſed firſt* the pumps to be worked daily, to extract that water before it becomes putrid; and to frequently rinſe and waſh the bilge, by letting in and pumping out the clean ſea water; and, if poſſible, to enter a pipe into the bilge for a ventilator; which he alſo firſt recommended to be ſo conſtructed as to be involuntarily worked night and day, always, by the agitation and motion of the veſſel: an eaſy conſtruction of ſuch a ventilator, this author once framed a model of, which he hath ſince heard ſomebody has aſſumed the invention of.—See § 2. p. 77.

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† See a recent farther proof of this, in Captain Bligh's Narrat. p. 17. below.

Perhaps there is not an obſervation of more eſſential importance to the healthineſs of a ſhip, than this above, as has been experimentally verified by the practice of ſcuttling and rinſing the bilge daily, as now commonly ordered, by judicious commanders, on board all our well regulated ſhips.

In the Tutamen Nauticum, was firſt recommended to the uſe of the navy and others, the *ſour-krout*, which now, upon the ſolid baſis of national experiment, has been found ſo conſpicuouſly beneficial in preſerving the lives of our ſeamen; even on board of the ſhips of circumnavigators, and others, in long and unhealthy voyages, in ſo ſignal a manner, that ſome of them have circled the terraqueous globe, without the loſs of a man by marine diſtempers (ſo uſually fatal in times paſt) in ſuch a ſalutary ſort as to excite the wonder of all mankind. Great praiſe and merit indeed may be allowed to be due to the late Lord Egmont, who, when he preſided at the Admiralty-board, was the perſon who firſt ſaw the benefit of this propoſal, and immediately cauſed it to be adopted on board the navy ; where it has had ſuch an admirably ſalutary effect, during the late war, as cannot have eſcaped the notice of every obſervant perſon ; and a wiſh that it may never be neglected, from every friend to this country and its naval conſequence. How healthy our ſhips were in the late war, every ſeaman can teſtify : the lives loſt by the ſcurvy, ſo far as can be learned, were very few indeed. That diſorder ſcarce ever appeared formidably in the navy ; and, where it did, there probably was a want of the proviſions recommended, or they had not obtained the merited confidence. This will appear an object of the moſt national moment, if it be true as was publiſhed in December 1762, taken, as is ſuppoſed, from returns made to the Houſe of Commons, that of 185,000 men raiſed, during the war before, above 130,000 periſhed by diſeaſes; and that two thirds of this number may be fairly charged to the account of diſeaſes originating in putrefaction; ſurely every motive of policy and humanity ſhould excite men to endeavour at finding out ſomewhat to check that fatal and deſtructive diatheſis; for if ſeamen could be preſerved from this, other kinds of diſeaſes would ſeldom endanger them. *Mackbride's Eſſays*, p. 176.

In the late war with France, that memorable moment, when the inferior Britiſh fleet kept at a diſtance, watching the movements of the very ſuperior French fleet in the channel, and lay off the Iſles of Scilly; whilſt the enemy threatened a deſcent upon the Engliſh ſhore, and to deſtroy our port of Plymouth; the Engliſh fleet being well provided with *ſour-krout*, and other Antiſcorbutics, and keeping the bilges of their ſhips ſcuttled, and conſtantly pumped, all which was firſt recommended in the Seaman's Preſervation, though they were out at ſea much longer than the enemy, yet they continued ſo remarkably healthy, that they loſt few or none of their people, by any of the more common maritime maladies: but the French fleet was ſo ſuddenly and ſorely viſited by ſickneſs, that they were obliged to leave parading on the Engliſh coaſt, and make all the ſpeed they could into Breſt harbour; and, as if Providence had fought for us, they loſt 1400 men by diſeaſes, in a few days; and when they came home, after *doing nothing*, they had ſcarcely ſound men enough on board to bring the ſhips ſafe into port. Surely this nation ſhould not have omitted a general thankſgiving to the God of battles, for ſuch a ſignal ſtretching out of his right hand for us, on this memorable event. But political commotions were ſo violent at the moment, that there was no time to think of Providence. See *Tut. Naut.* p. 75.

In the Tutamen Nauticum, § 59, p. 126, the author alſo recommended to the uſe of ſhips, a new contrivance of ſpruce beer extemporaneouſly made at all times, and in all places; which is a moſt cheap, pleaſant, ſalubrious antiſcorbutic beverage; eſpecially if drank in the effervefcence of fermentation. Dr. Hulme in his uſeful treatiſe on * the ſea ſcurvy, has very ſtrongly recommended this valuable drink to ſeamen, as made alſo with deal ſhavings, or turpentine wood, which he learned from *Tut. Nautic.* p.126, printed 1764.

The ſame work alſo recommends to ſhips to be well ſtored with many of our own ſylvan acid fruits, as from them, if preſerved, many choice fermenting liquors may be extemporaneouſly procured, of very ſalutary qualities, as experience has fully verified in Captain Cooke's and other circumnavigations; the commanders of which were prudent enough to obſerve theſe directions, and were amply requited for ſo doing, by the miraculous fewneſs of men they loſt in theſe long voyages.

P. 85, § 30. He recommends on ſhipboard, the uſe of Papin's Digeſtor, for providing the ſeamen with a good plenty of excellent ſoup, by the inſtant ſolution of meat-bones, and other animal ſubſtances in a few minutes, with a ſmall degree of heat, which he thinks has not been ſufficiently obſerved.

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* Libellus de Scorbuto.

Page 91. § 43. In the Tutamen Nauticum, was firſt recommended, an improved method of obtaining, from ſea water, &c. a quantity of potable wholeſome water, by the application of limbec heads, as covers to receive the ſteams of their culinary veſſels on board ſhips to be conducted by a pipe into a tub, properly placed for the purpoſe; by which method a conſiderably large quantity of good water will be obtained; if, by an inſerted ſtirrer or ſpatula, in the ſide of the upper part of the boiler, the contents, or the water, is kept continually or frequently agitated; and if a blaſt of the bellows be made uſe of to blow cold air into the limbec head, from time to time, through an orifice, occaſionally, to be opened in the ſame for that purpoſe.

T. N. firſt recommended the uſe of electricity to facilitate the recovery of the drowned. Tut. Naut. p. 11. See this ſtrenuouſly recommended by the Humane Society, and adopted by Mr. Kaite, in this eſſay on the recovery of the apparently dead, though without noticing from whoſe fountain they drew this cup of reviving water.

T. N. firſt told you that the fumes or vapour of boiling vinegar is the moſt effectual diſpeller of noxious air, and particularly the ſcorbutic miaſma, in confined loathſome places, and on board foul ſhips: and it has been found by experience that a gallon of vinegar thus employed, will do more effectual benefit, than a firkin of it, uſed in ſprinkling or waſhing a ſhip, or hanging up cloaths wetted with that acid liquor: which may be of important benefit to the community by promoting a more frugal œconomy, in the uſe of vinegar on ſhipboard, and at the ſame time a more ſalutary advantage to be obtained by it.

The great water-dock, p. 99, and Engliſh oak-bark, are ſtrongly recommended, as noble and experimented anti-ſcorbutics, cheap, and excellent ſubſtitutes for the Jeſuit's bark, capable of remedying in many marine diſeaſes. And he may be bold to ſay, that where theſe propoſitions have been careſully and ſtrictly obſerved, they have not failed to produce the moſt ſalutary effects: it may not be improper to remark again, that even circumnavigations have, under ſuch conduct, been accompliſhed without the loſs of one individual by the common marine diſtempers.

In the narrative of Captain Bligh's miraculous eſcape, given this day in the news-paper called the World, March 20, 1790; are the following paragraphs.

Thirſt, more than hungar, was found among their direſt ſufferings! Their alleviations were rain-water caught in the ſails, and thence ſqueezed out; ſometimes ſea-water; and in one inſtance *urine!*

One of the officers, philoſophically ſure, ſlacked his thirſt by dipping his limbs in the ſea! The conſequence was, that the pure element was imbibed by the abſorbent veſſels; and that the ſaline particles of the ſea-water were left, when dried, in a pellicle on the ſkin! See page 6 and 7, above.

Many more well authenticated inſtances of the ſucceſs of this method of avoiding the miſeries of extreme thirſt, which ought to be known to every ſeaman, could, if neceſſary, have been adduced.

An Account of the firſt Introduction of Coppering Ships' Bottoms.

THE great injury ſuſtained by ſhipping, from the timber-worm, in many quarters of the world, ſome years ago* excited much attention and diſcuſſion. The Society of Arts, Manufactures, and Commerce, inveſtigated this ſubject with a laudable perſeverance and patriotic zeal. Liberal rewards were propoſed, by that national inſtitution, for the diſcovery of a certain remedy to counteract or prevent this maritime evil. Various blocks of ſhip-timber, payed or prepared in divers manners, by different compoſitions, were tranſmitted to thoſe places, where the timber-worm was accuſtomed to make the moſt rapid depredations. Theſe, after being immerſed, ſome for many months, others for two years, were returned to the ſociety for their inſpection; who, by ſuch experiments, were fully convinced that the means adopted were totally inadequate to the remedy. At this period, 1760, the author of this addreſs ſuggeſted to ſeveral gentlemen of the ſociety, (among whom, as he recollects, were Dr. James Parſons, author of a paper on the Pholas timber-worm, and Mr. William Shipley, the founder and Regiſtrar of that inſtitution, whoſe teſtimonial to this point is herewith tranſmitted,) that he was aſſured that no method of preparing timber could ſtop the perforations of theſe corroding vermin; but, if the ſhips were covered with thin plates of ſheet-copper, he was convinced that every deſired purpoſe would be ſpeedily and certainly obtained; and that the ſmoothneſs of the ſurface would give accelerated velocity to ſhips in their progreſs through the water.

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* In the year 1759, 1760, and 1761, £50; and again, in 1762, £100; and, in 1762, 1763, 1764, and 1765, £200 premiums were offered; but no ſucceſsful candidate received any of theſe liberal rewards.

This ſuggeſtion was circulated and propagated; and, from ſuch intimation, the Lords of the Admiralty made the firſt experiment, by coppering the Alarm frigate in 1761; the Dolphin frigate was coppered, and made a voyage round the world, in the year 1764; the Hawke ſloop* was coppered in 1769;† and, (the experiment being approved,) ſince that, all the Royal Navy have been coppered. — The Hon. the Eaſt-India Company coppered the General Eliott Indiaman in 1782. Experience has ſo amply proved the wonderful advantages derived from the adoption of ſuch plan, that it has now become a general practice to copper all the ſhips of this opulent and reſpectable Company.

It may appear vain in the propoſer of an uſeful and beneficial plan to enlarge on its important intereſts to mankind; but the candid will excuſe him, while curſorily ſtating a few of the numerous advantages derived from its adoption. The ſhips of the Eaſt-India Company, amounting to nearly one hundred large veſſels, now coppered at an average-expenſe of £1800, have, by ſuch means, been enabled to perform their voyage in one-fifth leſs time, than previous to the adoption of ſuch improvement. The increaſed ſpeed in their ſailing muſt conſequently have diminiſhed the expenſe of the Company's ſhips, their riſk of ſhipwreck, and loſs of cargo, in an one-fifth proportion. In addition to ſuch incalculable advantages, coppered ſhips are found by experience (excluſive of the prevention of worms) to be preſerved in a ſound and navigable ſtate much longer than other veſſels, ſo as amply to repay the expenſe incurred by their protracted durability in ſerviceable uſe. The ſmooth and ſleek ſides and bottoms of coppered ſhips not only accelerate their motion through the water, but render the veſſels more tractable in a tempeſtuous ſea, leſs ſubject to violent ſhocks in boiſterous weather, diminiſh the danger of foundering, and take away from the great wear and tear ſuſtained by ſuch voyages. Clean ſhips likewiſe are more manageable, better anſwer the rudder, and are more obedient to the efforts of the ſeamen, than ſuch as have foul bottoms cruſted with barnacles, and ſhell-fiſh, which cannot eaſily fix their reſidence on copper. Practical ſeamen can point out numerous other advantages derived from this method, as the comparative eaſe with which coppered ſhips are brought off a lee-ſhore, and extricated from many other dangers too evident to be enumerated: and underwriters well know, that, in proportion to the ſhortening of voyages, the riſk of inſurance is diminiſhed in an equal degree.

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* This ſloop was ſent to the Eaſt Indies.

† I believe the above dates are correct.

The Certificate of Mr. WILLIAM SHIPLEY, *the firſt Founder, and, for many Years, the Regiſtrar, of the Society of Arts, Manufactures, and Commerce, in London.*

When a method of preſerving the bottoms of ſhips from the timber-worm was an object of conſideration with the Society of Arts, Manufactures, and Commerce, in London, and a premium by that ſociety was propoſed for the beſt method of preventing the injury done by thoſe inſects to ſhipping; — accordingly various experiments were made upon pieces of timber payed and prepared many different ways and ſent to different parts, where thoſe worms are known to be the moſt pernicioully prevalent, with a view to diſcover ſome means of preventing this great miſchief to navigation. At the time this matter was in agitation, I do very well remember that Dr. John Wilkinſon, M. D. did then obſerve and ſay that it was his opinion that nothing would be found ſo effectually to anſwer the purpoſe, and ſo completely to preſerve the timber of ſhips from the worms, as *plating or covering their bottoms with thin ſheets or plates of copper*; and I am certain this was ſo mentioned in the ſociety aforeſaid many years before copper was, to my knowledge, ever ſo applied; and I verily believe the above obſervation of Dr. Wilkinſon to have been the firſt ſuggeſtion, and to have given the primary hint for the coppering of the bottoms

toms of ſhips, and to have been the cauſe of that invention.

(As witneſs my hand,)

WILLIAM SHIPLEY.

Teſt.

ELIZABETH SHIPLEY.

(A true copy.)

Witneſs S. HENSHALL, Clerk.

London, June 12*th*, 1779.

Addreſs to the Chairman and the Governors of the Honourable the Eaſt-India Company, from the FIRST PROPOSER *of Coppering the Bottoms of Ships.*

GENTLEMEN,

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THE advantages which your Honourable Company has derived from this invention ſince the year 1783, when I am told you firſt adopted it, if duly conſidered, will appear of very extraordinary amount. May it not be allowed, that many millions ſterling have flowed into your treaſury from this apparently-unobſerved ſource? Could the diſcovery of the longitude, — that ardent object of maritime nations! — have been of more benefit to navigation and commerce? The greateſt commercial Company in the world will not need to be reminded of ſuch an intereſt, or withhold its gracious conſideration from the firſt human mover of ſuch important benefits to their concerns.

Many and glorious are the inſtances of your grateful attention to ſuch individuals as have rendered eſſential ſervices to your departments. Poſſibly this may be conſidered as one, and not the ſmalleſt.